



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/089,303

10/15/2007

Franz Josef Niedernostheide

32860-000314/US

7374

30596

7590

06/26/2008

HARNESS, DICKEY & PIERCE, P.L.C.

P.O.BOX 8910

RESTON, VA 20195

EXAMINER

QUINTO, KEVIN V

ART UNIT

PAPER NUMBER

2826

MAIL DATE

DELIVERY MODE

06/26/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/089,303	<b>Applicant(s)</b> NIEDERNOSTHEIDE ET AL.	
	<b>Examiner</b> Kevin Quinto	<b>Art Unit</b> 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,10-12 and 15 is/are rejected.
- 7) ☒ Claim(s) 7,9,13 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>29 March 2002</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 13 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 13 describes the anode connection as being a series circuit (with an inductance or capacitance) or a parallel circuit (with a resistance as well as an inductance or capacitance). However claim 12, the claim upon which claim 13 depends, already describes the anode connection as being a short circuit. Therefore claim 13 does not further delimit claim 12.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-6 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Hashimoto (JP 56-46338 A).

4. In reference to claim 1, Hashimoto (JP 56-46338 A) discloses a device which meets the claim. Figures 2, 4, and 6 of Hashimoto each discloses a thyristor

Art Unit: 2826

arrangement comprising a main thyristor (2) which includes a cathode and an anode and at least one auxiliary thyristor (1) which also includes a cathode and an anode.

There is a resistance device (3, 5, 6) which electrically connects the cathode of the auxiliary thyristor (1) and the cathode of the main thyristor (2); it has an ohmic resistance that is different from zero. There is an anode connection which electrically connects the anode of the auxiliary thyristor (1) and the anode of the main thyristor (2). There is a triggering device (not shown) for breakover triggering of the main thyristor (2) via the auxiliary thyristor (1) and the resistance device (3, 5, 6). The resistance device (3, 5, 6) defines a time- dependent ohmic resistance in such a way that this resistance has a relatively large value during a switch-on phase of the main thyristor (2) and a relatively small value during a current-carrying phase of the main thyristor (2).

5. With regard to claim 2, the resistance automatically decreases from the relatively large value to the relatively small value.

6. In reference to claim 3, the resistance device has an ohmic resistance (3, 6) of an essentially fixed value and at least a capacitance (5).

7. With regard to claim 4, the resistance device is a parallel circuit comprising the ohmic resistance (3, 6) of the essentially fixed value and the capacitance (5).

8. With regard to claim 5, the resistance device is a series circuit comprising the ohmic resistance (3, 6) of the essentially fixed value and the capacitance (5).

9. In reference to claim 6, the electrical anode connection is a short circuit.

10. With regard to claim 12, the electrical anode connection is a short circuit.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto (JP 56-46338 A) in view of Hoffman et al. (USPN 5,317,183).

13. In reference to claim 8, Hashimoto does not disclose integrating the main thyristor, the auxiliary thyristor, their respective cathodes and anodes, the resistance device, the anode connection, and the triggering device on a common body made of a semiconductor material. However Hoffman et al. (USPN 5,317,183, hereinafter referred to as the "Hoffman" reference) discloses that forming an integrated circuit on a common body made of a semiconductor material is well known in the art and offers the advantages of low cost (column 1, lines 13-26). In view of Hoffman, it would therefore be obvious to integrate the main thyristor, the auxiliary thyristor, their respective cathodes and anodes, the resistance device, the anode connection, and the triggering device on a common body made of a semiconductor material.

14. With regard to claim 11, the device of Hashimoto constructed in view of Hoffman has a triggering device and an auxiliary thyristor formed on a common body made of a semiconductor material. The triggering device of Hashimoto is an optical triggering device.

15. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto (JP 56-46338 A) in view of Konishi et al. (USPN 4,757,367).

16. In reference to claim 10, Hashimoto does not disclose forming the main thyristor, the auxiliary thyristor, their respective cathodes and anodes, on two separate semiconductor material bodies. However Konishi et al. (USPN 4,757,367, hereinafter referred to as the "Konishi" reference) discloses that forming the main thyristor, the auxiliary thyristor, their respective cathodes and anodes on two separate semiconductor material bodies is desirable in the art and since it allows the freedom to fix or replace the auxiliary thyristor (column 1, lines 34-61). In view of Konishi, it would therefore be obvious to form the main thyristor, the auxiliary thyristor, their respective cathodes and anodes, on two separate semiconductor material bodies.

17. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto (JP 56-46338 A) in view of Konishi et al. (USPN 4,757,367) and further in view of Hoffman et al. (USPN 5,317,183).

18. With regard to claim 15, the triggering device of Hashimoto is an optical triggering device. Hashimoto does not disclose integrating the auxiliary thyristor and the triggering device on a common body made of a semiconductor material. However Hoffman (USPN 5,317,183) discloses that forming an integrated circuit on a common body made of a semiconductor material is well known in the art and offers the advantages of low cost (column 1, lines 13-26). In view of Hoffman, it would therefore be obvious to integrate the auxiliary thyristor and the triggering device on a common body made of a semiconductor material.

***Allowable Subject Matter***

19. Claims 7, 9, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

20. The following is a statement of reasons for the indication of allowable subject matter: the examiner is unaware of any prior art which suggests or renders obvious a thyristor circuit configuration with a main thyristor and at least one auxiliary thyristor with respective anodes and cathodes such that a resistance device which electrically connects the cathodes of the auxiliary and main thyristors has an ohmic resistance that is different from zero while there is a non-short circuit anode connection which electrically connects the anodes of the auxiliary and main thyristors with a triggering device for breakover triggering of the main thyristor via the auxiliary thyristor and the resistance device which defines a time- dependent ohmic resistance in such a way that this resistance has a relatively large value during a switch-on phase of the main thyristor and a relatively small value during a current-carrying phase of the main thyristor as suggested in claim 7. The examiner is unaware of any prior art which suggests or renders obvious a thyristor circuit configuration with a main thyristor and at least one auxiliary thyristor with respective anodes and cathodes such that a resistance device which electrically connects the cathodes of the auxiliary and main thyristors has an ohmic resistance that is different from zero and an inductance while there is an anode connection which electrically connects the anodes of the auxiliary and main thyristors

with a triggering device for breakover triggering of the main thyristor via the auxiliary thyristor and the resistance device which defines a time- dependent ohmic resistance in such a way that this resistance has a relatively large value during a switch-on phase of the main thyristor and a relatively small value during a current-carrying phase of the main thyristor as suggested in claims 9 and 14.



**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quinto whose telephone number is (571)272-1920. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin Quinto/  
Examiner, Art Unit 2826

/A. Sefer/  
*Primary Examiner*  
*Art Unit 2826*